



Tata Steel Europe has developed four new high-margin steel grades for producing tailor-rolled blanks for the automotive sector.

THE CONTEXT



Tata Steel Europe's automotive steel customer, Mubea AG, identified two problem areas that it wanted the company to address. One problem was the large variation in the mechanical properties of its existing CR500 tailor-rolled product used in chassis frames and insufficient recrystallisation during heat-treatment. This defect causes poor formability with the potential for splitting and de-lamination of the material during cutting and forming of the sheet steel.

The other issue was that since most automotive manufacturers already use dual-phase (DP) steel grades in regular production, Mubea wanted to offer a DP grade for tailor-rolled blanks (TRB) to improve its market position as an automotive supplier.

THE INNOVATION



Tata Steel Europe worked in close co-operation with Mubea AG to successfully design four new steel grades for producing TRBs for use in light-weight chassis and structural body components. TRBs have varying thickness, which is produced via flexible rolling and batch annealing, where the thickest gauge is only present at those locations where it is needed for in-service performance.

The team identified critical process conditions for reducing scatter in the mechanical properties of the existing CR500 TRB, which led to the formation of a strongly improved CR500. Since Mubea used a different process from the normal DP production process and since no other steel-maker was able to produce a DP steel at the desired strength, the Tata Steel Europe team invented a novel chemistry and process for three more DP grades with tensile strength levels up to 1,000 MPa. The project ended because Mubea was unwilling to commit resources.

KEY CHALLENGE



TO DEVELOP STEEL GRADES WHERE THE SPECIFIED PROPERTIES ARE ONLY ACHIEVED AFTER PROCESSING AT THE CUSTOMER END

The team gained detailed knowledge of metallurgical concepts and of the outcomes achieved at each step of the process to ensure that the product it delivered could replicate these outcomes and eventually turn into the desired product at the customer's location. This also necessitated an intimate knowledge of the customer's process, which the team achieved by interacting closely with the customer and building a high level of trust.



POTENTIAL IMPACT



The four new high-margin steel grades developed by Tata Steel Europe have the potential to increase the company's revenues. Assuming potential sales of 17,500 tonnes per annum at a higher mark-up of

€250 PER TONNE

the company's EBITDA can increase by 6 million euro per annum by FY2023.